GCA CORPORATION
Technology Division

213 Burlington Road
Bedford, Massachusetts 01730
Telephone 617-275-5444
Telex 92-3339

December 21, 1984

Mr. David Hird
Environmental Enforcement Section
Room 1736
10th St. and Pennsylvania Ave.
Washington, D.C. 20530

Subject: Reilly Tar
(GCA 1-452-124)

Dear Mr. Hird:

In my capacity as Organic Section Head (resume attached), I have reviewed the data file for Contract No. 68-01-6316, W.A. 24. I can certify that the data presented in the Draft Final Report "Analysis of Environmental Samples for Region V Soil Core Samples from the Reilly Tar Site," June, 1983 (GCA-TR-83-57-G) is in fact final data. The analyses were performed in strict accordance with the cited methods with quality control measures sufficient to certify the precision and accuracy of the data generated.

I can further certify that the attached data submittals from Mr. Robert Bradway to Dr. Paul Bitter constitute final data. These analyses were performed under my direction as a Staff Scientist for the Analytical Laboratory, GCA/Technology Division.

Please do not hesitate to contact the undersigned for further clarification of the above information.

Sincerely,

Joanna M. Hall

Joanna M. Hall
Head, Organic Section
Laboratory Analysis Department

cc: Dr. Paul Bitter, U.S. EPA

JOANNA M. HALL

Professional Experience

Present Occupation: Organic Section Head, Analytical Laboratory, GCA/Technology Division, GCA Corporation, Bedford, Massachusetts. Ms. Hall directs laboratory activities in the area of chromatographic applications. She is also responsible for laboratory coordination with field activities concerning ambient and stack testing for organics.

Some of Ms. Hall's recent responsibilities have included:

- technical direction on EPA-sponsored program requiring trace analysis of pesticides, PCBs and base-neutral/acid extractable organics in fish tissue. Because the detection limits required by this program were lower than those attained by conventional analytical procedures, it was necessary to validate and implement a gel permeation chromatographic (GPC) cleanup technique.

- conducting a method development effort, also using GPC, to separate phenoxy acid herbicides from chlorinated benzenes and phenols in fish tissue.

- coordinating laboratory efforts in a program designed to measure destruction and removal efficiencies (DREs) of several boilers during the combustion of oil contaminated with chlorinated solvents. Laboratory participation includes: GC/ECD and GC/MS analyses of volatile and semivolatile organics in fuel feed and stack gas collected on sorbent material, analysis for chloride and trace metals in fuel feed and impinger solutions, and GC/MS analysis for chlorinated dioxins and furans in boiler ash.

- direction of an effort to develop and validate a GC/ECD analysis method for chlorinated solvents in stack gas at ppb levels.

Ms. Hall has also been responsible for the supervision of laboratory efforts in several programs requiring analysis of ambient air collected on polyurethane foam plugs. One recent program was the New Bedford Environmental Investigation, sponsored by the U.S. EPA, which required GC/ECD and GC/MS analysis on samples from 23 sites.

1979-1981: Senior Scientist, Analytical Laboratory, GCA/Technology Division, GCA Corporation, Bedford, Massachusetts. Ms. Hall was responsible for gas chromatographic analysis and high pressure liquid chromatographic analysis of trace organics in multimedia environmental samples. Her experience included methods development for toxic organics in aqueous samples. She coordinated the

analytical effort of several programs designed to evaluate PCB destruction efficiency in industrial boilers. In that capacity, Ms. Hall collected data from a wide variety of program measurements including HCl, PCBs, dioxins, and chlorinated dibenzofurans. Ms. Hall was responsible for preparing the project reports to include a summary of the combined sampling and analysis efforts. She has also provided technical assistance supporting the process of obtaining state/federal PCB combustion permits.

Ms. Hall participated in an EPRI technical planning study which inventoried organic emissions from fossil fuel combustion. The project involved a summary and critical evaluation of published emissions data.

1975-1979: EG&G, Bionomics, Wareham, Massachusetts. Ms. Hall was responsible for sample preparation techniques and methods development for TSCA organics in water, pesticides, herbicides and fungicides, and petroleum hydrocarbons in water, tissue, and sediments.

1973-1975: Analytical Chemist, Bionomics, Inc., Wareham, Massachusetts. Ms. Hall was involved in all phases of water and tissue analyses in support of biological toxicology testing. She was engaged in preparatory and analytical techniques for gas chromatography, atomic absorption spectrometry, IR spectrometry, and a variety of inorganic wet chemistry analyses.

Education

B.A., Chemistry, Emmanuel College, Boston, Massachusetts, 1973

Publications

Ten publications and presentations on High Pressure Liquid Chromatography methods development, priority pollutant determinations, bioassay testing and analysis of pesticides, organic emissions from combustion and the use of combustion technologies for the destruction of toxic organics (e.g., PCBs and chlorinated volatile organics).

GCA

GCA CORPORATION
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February 13, 1984

Dr. Paul Bitter
U.S. EPA - Region V
230 S. Dearborn St. (5HR)
Chicago, Illinois 60604

Subject: Reilly Tar Samples
(GCA 1-452-124 d)

Dear Dr. Bitter:

The attached Table 1 presents revised results of analyses for benzene extractable organics for the 44 requested Reilly Tar samples. Previously reported results were revised to accommodate blank correction by the average method blank value as shown in Table 2. Revised data differs from previously reported values by less than 8 percent for samples with benzene extractables above 500 mg/kg.

Quality control data generated for this program are presented in Tables 3 and 4. Table 3 shows the precision of duplicate gravimetric weight determinations for three sample extracts. Table 4 presents precision data for the extraction and analysis of triplicate aliquots of four program samples. Unfortunately, two of the four samples chosen for triplicate analysis had gravimetric residues below the 3.0 mg detection limit.

If you should have any questions on the enclosed information please do not hesitate to call me.

Very truly yours,

Robert M. Bradway

Robert M. Bradway
Manager
Laboratory Analysis Department

Enclosures

RMB/mdp

cc: **K. Levoir, Minn. Pollution Control**
M. Hult, USGS

TABLE 1. REVISED RESULTS OF ANALYSIS FOR BENZENE EXTRACTABLE ORGANICS

GCA Control No.	Sample I.D.	Sample Tag Number	Percent Moisture	Sample Weight (dry,g.)	Benzene Extractables (mg/kg)[a]
27675	10/18-3-4'-6'-ST-1	b	76.4	3.5	5400
27676	10/18-4-6'-8'-ST-1	b	18.8	12.2	< 250
27677	10/18-5'-8'-10'-ST-1	b	36.7	9.6	1600
27684	10/29-3-4'-6'-PB138	b	18.1	12.4	6200[c]
27838	11/8-2-2'-4'-PB140	b	6.5	14.0	17000[d]
27839	11/8-3-4'-6'-PB140	b	5.4	14.2	< 210
27840	11/8-4-6'-8'-PB140	b	22.5	11.6	< 260
27841	11/8-6-13'-15'-PB140	b	8.9	13.7	< 220
27915	11/17-2-8'-10'-PB144	b	21.1	11.8	400
27916	11/7-3-13'-15'-PB144	b	77.4	2.3	6700[d]
27919	11/17-7-28'-30'-PB144	b	11.3	13.4	< 220
35371	PB-143-#1	000103	81.9	2.7	33000
35372	PB-143-#2	000104	64.3	5.3	4800
35373	PB-143-#3A	000105	49.8	7.5	< 400
35374	PB-143#3B	000106	46.6	8.0	< 370[c]
35375	PB-143#5	000109	12.0	13.2	< 230
35376	PB-143-#10	000110	18.8	12.2	< 250
35377	B-145-#1	000201	32.1	10.2	42000
35378	B-145-#2	000202	78.6	3.2	120000
35379	B-145-#3	000203	45.6	8.2	390
35380	B-145-#4	000204	10.8	13.4	1100
35381	B-145-#6	000206	15.6	12.7	< 240
35382	B-145-#7	000207	17.8	12.3	< 240
35393	B-146-2 (2.5 - 4.5')	000121	8.4	14.0	600
35394	B-146-3 (8.0' - 10')	000123	10.5	13.4	2700
35395	B-146-4 (13' - 15')	000122	35.2	9.7	270

(continued)

TABLE 1. REVISED RESULTS OF ANALYSIS FOR BENZENE EXTRACTABLE ORGANICS
(continued)

GCA Control No.	Sample I.D.	Sample Tag Number	Percent Moisture	Sample Weight (dry,g.)	Benzene Extractables (mg/kg)[a]
35396	B-146-7 (28' - 30')	000124	65.3	5.2	1500
35397	B-146-8 (33' - 35')	000125	2.0	14.7	100
35398	B-146-10 (43' - 45')	000126	0.1	15.0	< 200[c]
35399	B-146-12 (48' - 50')	000127	13.2	13.0	< 230
35400	B-146-15 (58' - 60')	000129	6.1	14.1	< 210
35401	B-147-3 (13' - 15')	000211	72.4	4.1	3000
35402	B-147-4 (18' - 20')	000212	37.8	9.3	2000
35403	B-147-5 (23' - 25')	000213	10.9	13.4	1900[c]
35404	B-147-7 (33' - 35')	000214	15.4	12.7	120
35405	B-147-8 (38' - 40')	000216	12.1	13.2	< 230
35406	B-148 (13' - 15')	000132	63.0	5.5	< 550
35407	B-148 (18' - 20')	000133	53.5	7.0	< 430
35408	B-148 (23' - 25')	000134	22.2	11.7	210
35409	B-148 (33' - 35')	000135	13.4	13.0	1000
35410	B-148 (45' - 47')	000137	11.2	13.3	26000
35411	B-148-13 (53' - 55')	000138	8.6	13.7	< 220
35412	B-148-14 (53' - 60')	000139	14.5	12.8	< 230
35413	B-149-3 (13' - 15')	000219	13.8	12.9	< 230

[a]Results based on sample dry weight; values have been method blank corrected.

[b]No tag number available.

[c]Results based on mean of replicate extraction and analysis.

[d]Results based on mean of replicate gravimetric measurements.

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TABLE 2. QUALITY CONTROL DATA: RESULTS OF ANALYSIS OF METHOD BLANKS FOR BENZENE EXTRACTABLE ORGANICS

QC Number	Gravimetric Residue (mg)
865	3.0
879	0.2
890	2.0
905	2.2
906	0.6
	$\bar{X}$ = 1.6

TABLE 3. QUALITY CONTROL DATA: PRECISION OF REPLICATE GRAVIMETRIC DETERMINATIONS

GCA Control No.	Gravimetric Residue (mg)		
	A	B	Percent Difference[a]
27684-A	84	83	1.2
27684-B	73	68	7.1
27684-C	76	76	0.0
			$\bar{X}$ = 2.8

[a] Percent difference = $\frac{A - B}{(A+B)/2} \times 100$

Project 1-452-124 D

TABLE 4. QUALITY CONTROL DATA: PRECISION OF REPLICATE ANALYSIS FOR BENZENE EXTRACTABLE ORGANICS

GCA Control No.	Gravimetric Residue (mg/kg)				
	A	B	C	$\bar{X}$	RSD (%)
27684	5800	6800	6100	6200	8.3
35398	< 200	< 200	< 200	< 200	NA
35374	< 370	< 370	< 370	< 370	NA
35403	2000	1900	430[a]	1900	5.3[b]

RSD = Relative standard deviation.

[a]Data rejected as outlier based on Dixon's test for extreme observations (Code of Federal Regulations, U.S. Environmental Protection Agency. 40 Part 60. Standards of Performance for New Stationary Sources. Appendix A. Reference Methods, U.S. Government Printing Office, Washington, D.C. Revised as of 1 July 1981).

[b]Reported value based on percent difference calculation, where percent difference = $\frac{A - B}{(A+B)/2}$.

NA = Not applicable.

GCA CORPORATION
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213 Burlington Road
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May 1, 1984

Dr. Paul Bitter
U.S. Environmental Protection Agency
Region V
230 S. Dearborn Street (5HR)
Chicago, Illinois 60604

Subject: Reilly Tar Samples
(GCA 1-452-124 D)

Dear Dr. Bitter:

Enclosed please find results of analyses for benzene extractable organics for the 22 soil samples collected in November and December. Results shown in Table 1 have been corrected by the mean measured blank value listed in Table 2.

Quality control requirements for this segment of the program included the analysis of two samples in triplicate. Unfortunately, the samples chosen for replicate analysis had gravimetric residues below the 3.0 mg detection limit.

The procedures used for these analyses were identical to those detailed as Appendix A to the monthly report for January 1984 This submittal fulfills our requirements for benzene extractables analysis in soil samples. We will proceed with GC/MS analysis of selected extracts, only upon your authorization.

If you should have any questions on the enclosed information please do not hesitate to call me.

Very truly yours,

Robert M. Bradway
Manager
Laboratory Analysis Department

Enclosures

RMB/mdp

cc: K. Levoir, Minn. Pollution Control
M. Hult, USGS

Project 1-452-124A

TABLE 1. RESULTS OF ANALYSIS FOR BENZENE EXTRACTABLE ORGANICS

GCA Control Number	Sample I.D.	Sample Tag Number	Percent Moisture	Sample Weight (dry,g)	Benzene Extractables (mg/kg)[a]
35638	B-149- 8 38-40'	000222	12.8	13.1	< 230[b]
35639	B-149- 9 43-45'	000223	15.9	12.6	< 240
35642	B-150- 4 18-20'	000226	19.7	12.0	< 250
35643	B-150- 5 23-25'	000227	25.0	11.2	850
35644	B-150- 8 38-40'	000228	11.3	13.3	< 230
35647	B-150- 58-60'	000231	16.5	12.5	< 240
35649	B-151- 6 17-19'	000233	9.4	13.6	< 220
35650	B-151- 7 22-24'	000234	12.3	13.2	< 230
35652	B-151- 9 32-34'	000236	15.2	12.7	< 240
35653	B-151-10 37-39'	000237	6.9	14.0	< 220[b]
35655	B-151 42-44'	000239	12.5	13.1	< 230
35657	B-152- 2 8-10'	000241	11.7	13.2	< 230
35658	B-152- 3 13-15'	000242	7.7	13.8	< 220
35659	B-152- 5 23-25'	000243	12.3	13.1	< 230
35662	B-152-13 48-50'	000246	2.7	14.6	< 200
35663	B-152-14 53-59'	000247	10.8	13.4	< 220
35667	B-153- 6 28-30'	000140	14.8	12.8	< 230
35669	B-153- 9 38-40'	000142	11.1	13.3	< 220
35672	B-153- 2 8-10'	000249	72.4	4.1	840
35673	B-153- 3 13-15'	000250	66.2	2.4	2700
35674	B-153- 4 18-20'	000251	22.4	9.3	520
35675	B-153- 5 23-25'	000252	13.7	12.9	<230

[a]Results based on sample dry weight; values have been method blank corrected.

[b]Results based on mean of replicate extraction and analysis.

Project 1-452-124A

TABLE 2. QUALITY CONTROL DATA: RESULTS OF ANALYSIS OF METHOD BLANKS FOR BENZENE EXTRACTABLE ORGANICS

QC Number	Gravimetric Residue (mg)
075	0.60
100	0.50
	$\bar{X}$ = 0.55